

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method for detecting changes in ~~incident~~
spatially nonuniform optical radiation intensity distribution, comprising:
driving current through one or more ~~active~~-areas of photoconductive material of a
detector, by means of one pair of electrical contacts to source and sink the
current, while the incident optical radiation illuminates one or more of the
active-areas of photoconductive material; and
~~sensing~~measuring the voltage across one or more of the ~~active-areas~~ of
photoconductive material using at least two electrical contacts that are not
identical to the current source and sink contacts, a change in the measured
voltage being indicative of ~~thea changes~~change in incident optical
radiation illumination.
2. (Currently Amended) The method of claim 1, ~~further comprising wherein~~
measuring the voltage comprises utilizing an observation instrument ~~in the step of~~
~~sensing voltage~~.
3. (Currently Amended) The method of claim 1, ~~the step of sensing wherein~~
measuring the voltage comprises determining cyclical variations in the voltage
to isolate one or more frequencies with signal strength above a noise floor.
4. (Currently Amended) The method of claim 1, ~~the step of sensing wherein~~
measuring the voltage comprises determining transient variation in the voltage
in one or both of a time domain and a frequency domain.
5. (Currently Amended) The method of claim 1, ~~the step of sensing~~
~~comprising wherein~~ measuring the voltage comprises determining periodic variation in
the voltage in one or both of a time domain and a frequency domain.
6. (Currently Amended) The method of claim ~~[[1]]~~2, ~~the step of sensing~~
~~comprising wherein~~ utilizing an observation instrument comprises utilizing one or more of
a spectrum analyzer and oscilloscope.

7. (Currently Amended) The method of claim 1, further comprising determining motion of an object surface that causes the ~~changes~~change in incident optical radiationillumination.

8. (Currently Amended) The method of claim 7, ~~the step of wherein~~ determining motion ~~comprising~~comprises analyzing the voltage in a time domain.

9. (Currently Amended) The method of claim 7, ~~the step of wherein~~ determining motion ~~comprising~~comprises analyzing the voltage in a frequency domain.

10. (Currently Amended) ~~[[A]]The method [[for]]of claim 7, further determining surface motion;~~ comprising:

illuminating ~~[[a]]the~~ surface with a laser having a wavelength that is smaller than defined geometric features of the surface ~~such that;~~ and detecting moving speckle indicative of surface motion illuminates the areas of photoconductive material while the; ~~driving current is driven through one or more active the areas of photoconductive material; and wherein surface motion is determined by a detector while the moving speckle illuminates the active areas;~~ sensing voltage across one or more of the active areas ~~of photoconductive material to detect the surface motion.~~

11. (Currently Amended) The method of claim 10, ~~the step of wherein~~ sensing voltage ~~comprising~~comprises determining voltage signals in a time-domain.

12. (Currently Amended) The method of claim 10, ~~the step of wherein~~ sensing voltage ~~comprising~~comprises determining voltage signals in a frequency-domain.

13. (Currently Amended) The method of claim ~~[[10]]~~7, ~~wherein~~ the surface motion ~~of the object surface~~ ~~comprising~~comprises surface displacement.

14. (Currently Amended) ~~[[A]]The method of claim 10, for determining~~wherein illuminating the surface motion~~[[.]] comprising~~comprises generating an interference pattern that varies with surface motion~~[[.]]~~ and detecting the interference pattern by:

driving current through one or more of ~~the active-~~areas of a ~~detector~~photoconductive material while the interference pattern illuminates the ~~active-~~areas of photoconductive material; and sensing voltage across one or more of the ~~active-~~areas of photoconductive material to detect the surface motion.

15. (Currently Amended) The method of claim 14, ~~the step of wherein~~ sensing ~~comprising~~comprises determining voltage signals in a time-domain.

16. (Currently Amended) The method of claim 15, ~~the step of wherein~~ sensing ~~comprising~~comprises determining voltage signals in a frequency-domain.

17. (Currently Amended) The method of claim 14, wherein the surface motion ~~comprising~~comprises surface displacement.

18. (Currently Amended) A ~~sensor~~device for detecting changes in a spatially nonuniform optical intensity distribution incident ~~optical radiation on the device~~, comprising:

~~a detector having~~ one or more active areas ~~formed of~~ photoconductive material located between input electrodes for driving current, provided by a source, through the areas of photoconductive material;

~~a source for applying current through the active areas~~output electrodes for sensing a voltage drop across the areas of photoconductive material, the input electrodes being different from the output electrodes;

one or more conductive paths connecting the input electrodes and the output electrodes to the areas of photoconductive material to form a series circuit; and

electronics connected to the output electrodes for determining a voltage drop across ~~at least one or more of~~ the areas of photoconductive material, [[the]]a change in voltage drop being indicative of [[the]]a changeschange in theincident optical radiationintensity distribution.

19. (Currently Amended) The ~~sensor~~device of claim 18, the source comprising one of a constant current source, a voltage source, a time-varying current source, and a time-varying voltage source.

20. (Currently Amended) The sensordevice of claim 18, the electronics connected to the source and configured to modulate the source so that current is modulated through the active areas at a desired frequency, to improve signal to noise.

21. (Currently Amended) The sensordevice of claim 18, the detector, source and electronics configured to provide a four point measurement.

22-23. (Cancelled)

24. (Currently Amended) The sensordevice of claim 18, further comprising ~~an array of one or more~~ optical fibers and one or more lasers generating one or more laser beams into one or more first ends of the optical fibers, the ~~active areas of~~ photoconductive material ~~forming one of a two-dimensional and three-dimensional array~~ matched to the ~~array of~~ optical fibers to detect the laser beams, as the incident optical radiation, at second ends of the array of optical fibers, wherein voltage drops across the ~~active areas of~~ photoconductive material indicate perturbations on the array of optical fibers.

25. (Currently Amended) The sensordevice of claim 24, the array of optical fibers comprising either single mode fibers or multi-mode fibers.

26. (Currently Amended) The sensordevice of claim 18, further comprising a laser, a power splitter, and an optical fiber coupled to the power splitter; the laser generating a laser beam into one or more arms of the power splitter; the laser beam exiting the optical fiber, reflecting off of a surface and reentering the optical fiber to interfere with the laser beam within the optical fiber; the detector arranged to detect interfering laser radiation, as the incident optical radiation, from the power splitter, the voltage drop being indicative of motion of the surface.

27. (Currently Amended) The sensordevice of claim 26, the power splitter comprising one of a multi-mode fiber and bulk optics power splitter.

28-29. (Cancelled)

30. (Currently Amended) The sensordevice of claim ~~[[29]]~~18, the input electrodes, the output electrodes and the active areas of photoconductive material being collinear.

31. (Cancelled)

32. (Currently Amended) The ~~detector~~device of claim ~~[[31]]~~18, the photoconductive material comprising a semiconductor.

33. (Currently Amended) The ~~detector~~device of claim ~~[[31]]~~18, the photoconductive material comprising one of a III-V semiconductor and a II-VI semiconductor, the III-V semiconductor being defined by one or more components of the composition from the III column of the periodic table, and one or more components of the composition from the V column, the II-VI semiconductor being defined by one or more components of the composition from the II column of the periodic table, and one or more components of the composition from the VI column.

34-36. (Cancelled)

37. (Currently Amended) The ~~detector~~device of claim ~~[[31]]~~18, further comprising resistive material disposed between the electrodes and the ~~active-areas of~~photoconductive material .

38. (Currently Amended) The ~~detector~~device of claim ~~[[31]]~~18, further comprising semiconductor material disposed between the electrodes and the ~~active-areas of~~photoconductive material .

39. (Currently Amended) The ~~detector~~device of claim ~~[[31]]~~18, further comprising a mask to block incident optical radiation incident on at least one of the ~~active areas~~of photoconductive material.

40. (Currently Amended) The ~~detector~~device of claim ~~[[31]]~~18, the ~~active areas of~~photoconductive material comprising at least three active areas, wherein a first one of the active areas separates a first ~~of the~~input electrodes from a first ~~of the~~output electrodes, and wherein a second one of the active areas separates a second ~~of the~~input electrodes from a second ~~of the~~output electrodes, such that current flows from the first input electrode through the active area and to the second input electrode, such that the first input and output electrodes do not short-circuit, and such that the second input and output electrodes do not short-circuit.

41. (Currently Amended) The ~~detector device~~ of claim [[31]]18, the active areas of photoconductive material forming one of a two-dimensional and three dimensional array.

42. (Currently Amended) The detector of claim 41, wherein the two-dimensional and three dimensional array[[.]] is used to detect ~~the~~ output from a matching array of optical fibers.

43. (Currently Amended) [[A]]The method of claim 1, wherein the incident optical radiation comprises~~for assessing relative position between two objects, comprising: generating an interference or diffraction pattern dependent upon a distance between the two objects, further comprising:~~

[[; and]] sensing changes in the interference or diffraction pattern to achieve optimal alignment between the objects by:

driving the current through one or more active~~the~~ areas of photoconductive material of [[a]]~~the~~ detector while the interference or diffraction pattern illuminates the ~~active~~ areas of photoconductive material; and sensing voltage across ~~one or more of the active~~photoconductive areas, wherein the[[a]] change in the voltage being indicative of~~indicates~~ a change in the distance between the objects, and further comprising the steps of: assessing relative position between the objects; and optimally aligning the objects, according to the changes in the interference or diffraction pattern.

44. (Currently Amended) The method of claim 43, the incident optical radiation generated by~~step of generating comprising~~ illuminating a gap between the objects with a laser.

45. (Currently Amended) [[A]]The method [[for]] of claim 43, wherein assessing relative position comprises assessing relative angles between the two objects, and wherein the ~~comprising: generating an interference or diffraction pattern dependent upon an angular relationship between the two objects; and sensing changes in the interference or diffraction pattern to achieve optimal alignment between the objects by: driving current through one or more active areas of a detector while the interference or~~

~~diffraction pattern illuminates the active areas; and sensing voltage across one or more of the active areas, a change in the voltage being indicative of~~indicates a change in the angular relationship between the objects.

46. (Currently Amended) ~~[[A]]The method of claim 1, wherein for detecting the relative intensities of incident optical, comprising: driving current through two or more active areas of a detector while incident optical radiation illuminates the active areas; and sensing~~measuring the voltage comprises measuring across the active areas; voltage ratios across the active areas of photoconductive material to determine~~being indicative of~~ intensity ratios of the incident optical radiation.

47. (New) The method of claim 1, further comprising comparing the time rate of change of the voltage across at least two areas of photoconductive material, a difference therein being indicative of spatial characteristics of the spatially nonuniform optical intensity distribution.